

ABSTRACT

A method of producing a semiconductor device
5 wherein an already formed opening portion inner wall of
an organic-based interlayer insulation film is prevented
from changing in quality or corroding when performing
etching on another organic material. The production
method includes a step of depositing organic-based
10 interlayer insulation films (4, 6), a step of forming an
opening on the organic-based interlayer insulation films
(4, 6), and a step of silylating a wall surface portion
of the organic-based interlayer insulation films (4, 6)
exposed in the opening portion for reforming (forming
15 reformed layers (4a, 6a) by silylation). A more
preferable production method further includes a step of
forming protective layers (4b, 6b) including an
inorganic-based insulation material on a surface of the
silylated opening portion wall surface.

Explanation of References

- 1 ... FIRST INTERLAYER INSULATION FILM
- 2 ... LOWER LEVEL WIRING LAYER
- 5 3, 5 ... ETCHING STOPPER FILM
- 4 ... SECOND INTERLAYER INSULATION FILM
- 4a... SILYLATED LAYER, SILYLATED DIFFUSION LAYER OR MIXED LAYER
- 4b... SILICON OXIDE LAYER (PROTECTIVE LAYER)
- 10 6 ... THIRD INTERLAYER INSULATION FILM
- 6a... SILYLATED LAYER, SILYLATED DIFFUSION LAYER OR MIXED LAYER
- 6b... SILICON OXIDE LAYER (PROTECTIVE LAYER)
- 7, 7'... HARD MASK FILM
- 15 8, 8a, 8b... ORGANIC-BASED ANTI-REFLECTION FILM (ORGANIC FILM)
- 9 ... BARRIER METAL LAYER
- 10... COPPER
- 40... SECOND INTERLAYER INSULATION FILM
- 20 R... RESIST
- VH... VIA HOLE